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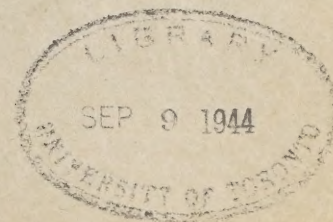
DOMINION OF CANADA  
DEPARTMENT OF AGRICULTURE

AN ECONOMIC STUDY OF LAND SETTLEMENT IN THE ALBERTVILLE-GARRICK  
AREA OF NORTHERN SASKATCHEWAN  
1941

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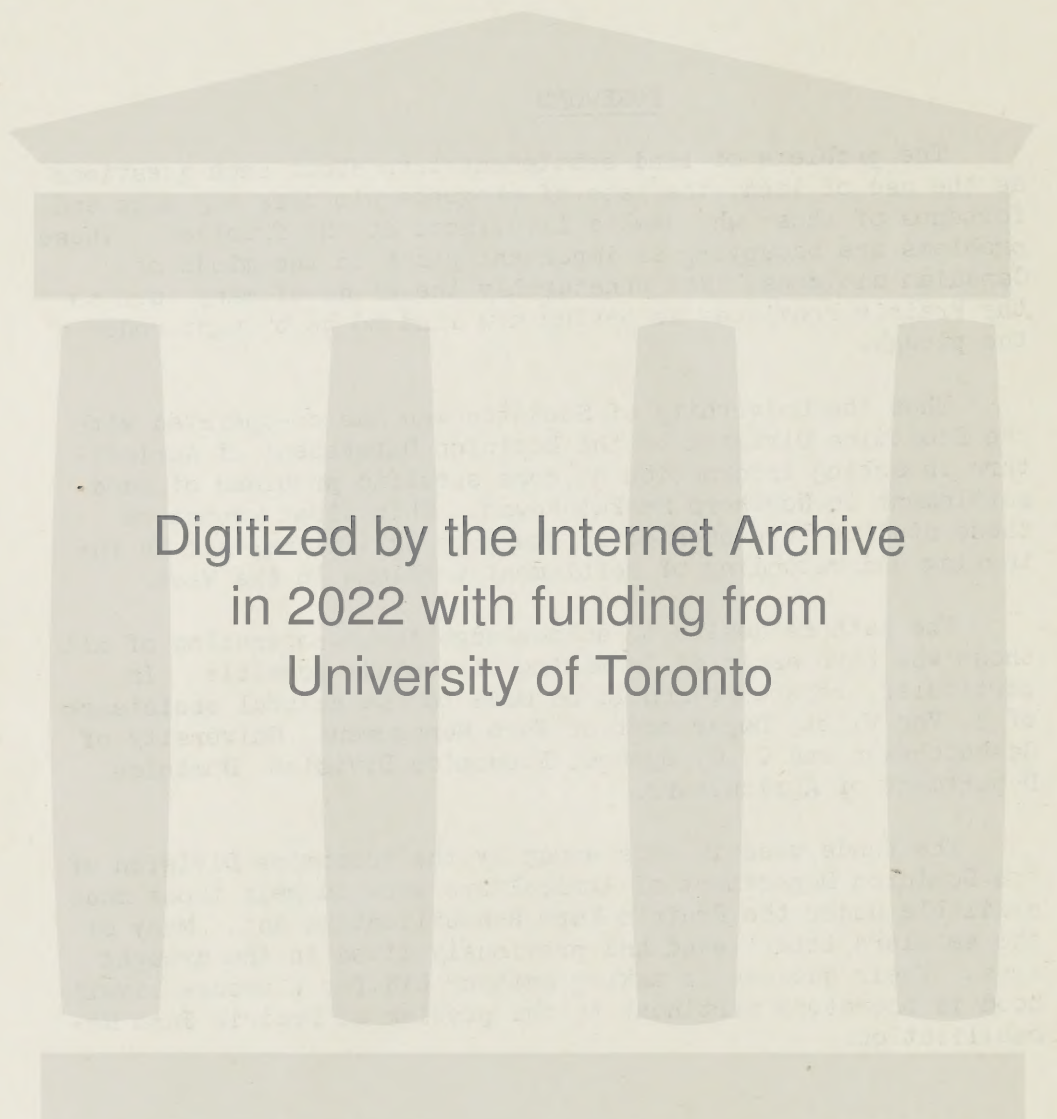
## FOREWORD

The problems of land settlement turn about such questions as the use of land, the rate of progress pioneers may make and fortunes of those who seek a livelihood at the frontier. These problems are occupying an important place in the minds of Canadian citizens. Not unnaturally the minds of many turn to the Prairie Provinces as having new land to be brought under the plough.

Thus the University of Saskatchewan has co-operated with the Economics Division of the Dominion Department of Agriculture in seeking information on some specific problems of land settlement in Northern Saskatchewan. This first report on these studies is presented in the hope that it may aid in furthering understanding of settlement problems in the West.

The authors desire to acknowledge the co-operation of all those who have assisted in making this study possible. In particular, reference should be made to the helpful assistance of H. Van Vliet, Department of Farm Management, University of Saskatchewan and C. C. Spence, Economics Division, Dominion Department of Agriculture.

The funds used in this study by the Economics Division of the Dominion Department of Agriculture were largely those made available under the Prairie Farm Rehabilitation Act. Many of the settlers interviewed had previously lived in the drought area. Their success in making another bid for a secure livelihood is therefore pertinent to the problem of Prairie Farm Rehabilitation.



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# AN ECONOMIC STUDY OF LAND SETTLEMENT IN THE ALBERTVILLE-GARRICK AREA OF NORTHERN SASKATCHEWAN

E. C. Hope<sup>(1)</sup> and R. A. Stutt<sup>(2)</sup>

## Introduction

Future expansion of settlement in Saskatchewan will be chiefly confined to wooded or forested regions of the north. Practically all land suitable for farming in the prairie regions of these provinces has now been occupied and attention is increasingly being given to the possibilities of opening up for settlement blocks of land in the wooded areas. Undoubtedly, after the war, there will be many returned soldiers who wish to take up farming as a livelihood, and for many of them the only land available will be in the northern forest regions of Alberta and Saskatchewan.

In view of this situation the Department of Farm Management of the University of Saskatchewan, and the Economics Division of the Dominion Department of Agriculture, undertook an economic study of land settlement in certain selected areas along the northern pioneer fringe of settlement in Saskatchewan. In Alberta the Department of Political Economy of the University of Alberta, co-operated with the Dominion authorities in making similar studies for that province. Tentative plans were made for a study extending over two years. This report concerns the information obtained in Saskatchewan during 1941, the first year of the project.

Specifically the objectives of this series of settlement studies were:

- (1) To measure the financial progress that the settlers have been able to make on the northern pioneer fringe.
- (2) To isolate the factors that have been favourable to progress.
- (3) To find answers to a number of questions which might be valuable to a settlement agency, such as: What is the minimum size of farm which is suitable for settlement purposes? How much capital in the form of real estate, machinery and live stock is it necessary for a settler to have in order to make a reasonable start at farming in the wooded regions? What is the typical cost of clearing the land? What additional sources of income can the settler depend upon? What is the debt carrying capacity of the small farm in the forest region? How do the levels of living in the forest region compare with the long-settled prairie regions? What crops are adapted to the region? How fertile are the different soil types? Can the fertility be maintained?

## Description of the Area

Location.- The area selected for study lies north of the Saskatchewan River. It consists of a block of 27 townships including townships 51, 52 and 53, in ranges 16 to 24, west of the 2nd meridian. These townships are situated in Local Improvement Districts Nos. 488, 489, 518, 519, 520 and the Rural Municipality of Garden River No. 490. Prince Albert is about 20 miles southwest of the western boundary of the

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surveyed area and the town of Nipawin about 20 miles east of the eastern boundary. In this block of townships a sample of 304 pioneer farm business records was obtained. A random selection of about one-quarter to a third of the settlers in each township was included in the study.

Railways and Roads.- The Prince Albert-Nipawin branch line of the Canadian Pacific Railway traverses the center of the region from east to west. Most of the farms are situated within 5 miles of a shipping point. Provincial highway No. 55, a well-graded dirt road, runs through the center of the district linking up Nipawin on the eastern side with the Prince Albert National Park highway on the west. In the well settled areas, close to the railway and highway, most of the side roads are partially graded but at a distance of about 3 to 5 miles the side roads dwindle down to mere trails.

Population Density.- The census of 1911 reported a population of only 125 people in the surveyed area, all of whom were located in township 57, ranges 23 and 24, in the southwestern portion of the area situated closest to Prince Albert. This portion of the area was settled first because of its proximity to the city of Prince Albert. In 1929-30 a high-level railway and traffic bridge was constructed across the Saskatchewan river at Nipawin. The construction of this bridge opened up the eastern portion

Table 1. Changes in Population and Acres of Occupied and Improved Land in the Albertville-Garrick Area, by Census Years 1916 to 1941(1)

	: Total	:	Acres	:	Acres	:	Percentage	:
	: population	:	occupied	:	improved	:	improved	:
1916	1,346		48,641		5,198		10.7	
1921	2,037		119,219		10,135		8.5	
1926	3,011		143,526		22,822		15.9	
1931	5,619		272,752		62,584		22.9	
1936	8,707		388,543		94,622		24.4	
1941	9,830		478,877		192,698		40.2	

(1) Census of Canada.

of the surveyed area for settlement. By 1932 the Canadian Pacific Railway was operating between Nipawin and Prince Albert and thereafter the area progressed rapidly. The progress of settlement is shown in table 1. Until 1926 all the population was situated in the western third of the area. The expansion in population since 1931 has been practically all in the eastern two-thirds of the area. The area of improved land has increased rapidly both in actual acres and relative to the total occupied area.

Climate.- The area surveyed is situated in the sub-humid northern Park Belt. Two weather reporting stations adjoin the surveyed area, Prince Albert on the west and Lost River on the east. The long-time average rainfall at Prince Albert is 15.6 inches which may be compared with 15 inches for Swift Current. The average rainfall for the growing season (April to July inclusive) is 7.3 inches for Prince Albert and 7.4 inches for Lost River compared with 7.9 inches for the same period at Swift Current.

Although the annual rainfall of this area is about the same as for southern Saskatchewan the cooler summers of the north result in a much lower rate of evaporation and consequently greater moisture efficiency. Crop failures due to drought conditions are practically unknown.

In earlier years when this northern area was covered with heavy bush, late



spring and early fall frosts were fairly common and often severe crop losses resulted from frost damage. Within recent years the clearing of the bush cover has reduced this danger considerably, although the danger is still present in local areas of small clearings surrounded by heavy bush.

The frequencies of the dates of the last killing frost (29°F) of spring and the first killing frost of fall (29°F) are shown in tables 2 and 3.

Table 2. Frequency of Dates of Last Killing Spring Frosts at Prince Albert and Lost River, 1921-1943

Dates		Number of years of occurrence	
		Prince Albert	Lost River
May	1 - 4	4	1
	5 - 9	6	2
	10 - 14	2	5
	15 - 19	4	2
	20 - 24	3	4
	25 - 31	4	4
June	1 - 4	0	1
	5 - 9	0	1
	10 - 14	0	2
	15 - 19	0	1
Average dates		23 May 13th	23 May 23rd

Late spring frosts are more frequent at Lost River at the eastern end of the surveyed area, than at Prince Albert. But even at Lost River, in only two years out of twenty-three were June killing frosts reported. These killing frosts would cut down most garden produce but would not injure grain crops permanently.

Early fall frosts are also more frequent at Lost River than at Prince Albert. In the twenty-two years from 1921 to 1942 no killing fall frosts occurred at Prince Albert before September 9th whereas at Lost River killing frosts were reported before this date in three out of the twenty-two years. The average date for the first killing frost is September 22nd for Prince Albert and September 17th for Lost River.

Table 3. Frequency of Dates of First Killing Fall Frosts at Prince Albert and Lost River, 1921-1942

Dates		Number of Years of occurrence	
		Prince Albert	Lost River
August	25 - 31	0	1
September	1 - 4	0	1
	5 - 9	0	1
	10 - 14	3	5
	15 - 19	5	5
	20 - 24	5	4
	25 - 30	6	4
October		3	1
Average dates		22 September 22nd	22 September 17th



The length of growing season is 131 days for Prince Albert and 116 for Lost River, ample time in which to mature oats, barley, wheat and garden produce. Occasionally certain kinds of the more tender garden produce are severely damaged by frost but grain crops are not seriously affected although occasionally grades have been lowered by frost damage.

Soils.- The western portion of the surveyed area is in the transition zone between the tall grass "park" zone and the grey wooded soil zone. The eastern portion of the area is practically all in the grey wooded soil zone. The soils are predominantly podsolized and degraded loams to clay loams. The podsolized soils are ashy grey, highly leached soils, developed under a forest cover. The degraded soils are usually black to grey-black in colour and more fertile than the podsolized soils. Although podsolized loams and clay loam soils in the forest zone are frequently quite stoney, in the Albertville-Garrick area stoniness is not a serious hindrance to cultivation except in a few localized areas.

Vegetation.- The typical vegetation of the area was originally a heavy forest cover of white and black spruce, white and black poplar, tamarack and jack-pine, interspersed with small grassy meadows and larger areas of muskeg and peats. Much of the best timber has been logged off and fires have repeatedly swept through the area so that the typical cover on the uncleared land is now a short growth of young trees with willow clumps on the low-lying lands and with larger areas of original black spruce muskeg untouched by the fires. Because of the frequent fires clearing costs within recent years have been quite low.

Arability.- The district between Albertville and Garrick is remarkable for its high degree of potential arability. There are no large areas which are non-arable because of poor topography, stoniness or light textured soils for a distance of at least six miles on either side of the main highway running from the Prince Albert National Park Highway to White Fox, a distance of about 70 miles.

All the farmers visited on the survey were asked to give their own estimates of the amount of land which could eventually be broken out on their farms. Table 4 summarizes this information.

Table 4. Relation of Soil Type to Acres of Arable Land per Quarter Section, Albertville-Garrick Area, 1941

Acres of potentially arable land per quarter- section	: Sand to		: Very fine		: Clay loams		: Peat, muskeg		: All soils:	
	: fine sandy		: sandy loams		: to clays		: and alkali		: All soils:	
	: loam		: to loams		:		:		:	
	No. of	Per	No. of	Per	No. of	Per	No. of	Per	No. of	Per
	quar-	cent	quar-	cent	quar-	cent	quar-	cent	quar-	cent
	ters		ters		ters		ters		ters	
Under 30	1	.9	-	-	-	-	-	-	1	0.2
30 - 49	-	-	-	-	1	0.7	-	-	1	0.2
50 - 69	2	1.8	1	0.5	-	-	-	-	3	0.7
70 - 89	2	1.8	3	1.7	2	1.4	1	8.3	8	1.8
90 - 109	1	.9	4	2.3	2	1.4	-	-	7	1.6
110 - 129	5	4.5	12	7.0	5	3.5	-	-	22	5.0
130 - 149	10	8.9	19	10.8	8	5.6	1	8.3	38	8.6
150 plus	91	81.2	136	77.7	124	87.4	10	83.4	361	81.9
Total	112	100.0	175	100.0	142	100.0	12	100.0	441	100.0



Of the 441 quarter-sections of land included in the survey, 81.9 per cent had a potential arability of 150 acres or more; 95.5 per cent had a potential arability of 110 acres or more. There were no important differences in the arability of the lands as between soil types.

### The People

Nationality.— People of many different nationalities have settled in the Albertville-Garrick area. In the western end of the area, centering around Albertville the population is predominantly French-Canadian. Further east, centering around Meath Park and Weirdale, many different nationalities from Central Europe are to be found. People of British descent predominate in the eastern half of the area. The distribution of the settlers by nationality is shown in table 5.

Table 5. Nationality of the Farm Operators in the Albertville-Garrick Area, 1941

Nationality		Number of operators		Nationality		Number of operators	
Ukrainian, Russian,				French		24	
Polish	76			German, Swiss			
Other Slav Races	4			and Austrian		22	
English and Welsh	59			Dutch and Belgian		5	
Irish	40			Italian		1	
Scottish	39						
Scandinavian	34			Total		304	

Age.— Most of the settlers were comparatively young when they started on their present farms. Fifty-four per cent were less than 35 years old and only 13 per cent were 50 years or older.

Table 6. Age at Date of Settlement and Present Age of Settlers in the Albertville-Garrick Area, 1941

Age groups	At date of settlement		1941	
	Number	Percentage	Number	Percentage
Less than 20 years	15	5	0	-
20 to 24	41	13	3	1
25 to 29	62	20	18	6
30 to 34	48	16	32	11
35 to 39	42	14	47	16
40 to 44	36	12	56	18
45 to 49	21	7	39	13
50 and over	39	13	107	35
Total	304	100	302(1)	100

(1) Two farms operated by widows of deceased original settlers were omitted.

At the present time only 18 per cent are under 35, and 35 per cent are 50 years or older.

Occupational Background.— The chief occupations of the farm operators before settling in the Albertville-Garrick area are shown in table 7. The majority of the settlers had experience on farms before settling in the area either as farm

operators, as farmer's sons or hired farm labourers.

Table 7. Chief Occupation of Farm Operators Before Settling on Present Farm, Albertville-Garrick Area, 1941

Occupation	Number of operators	Percentage
Farmer or farmer's son	194	63.7
Hired man on farm	45	14.8
Labourer	40	13.2
Clerk	1	0.3
Professional	11	3.6
Lumberman, trapper	8	2.7
Soldier or sailor	2	0.7
Mechanic	3	1.0
Total	304	100.0

A considerable number of the settlers who operated farms before taking up their present farms had migrated from prairie farms where they had met with bad luck because of crop hazards such as drought, severe frosts or rust.

Education.- The education of the farm operators is shown in table 8. The level of education of this group of operators was about the same as for other districts of the Province.

Table 8. Education of Farm Operators, Albertville-Garrick Area, 1941

Grades	Number of operators	Percentage
0 - 3	56	18.4
4 - 8	199	65.5
9 - 10	46	15.1
11 - 12	2	1.0
Over 12	1	-
Total	304	100.0

About two-thirds of the operators had an educational level of grades 4 to 8. About 84 per cent had only attained grades of grade 8 or lower and only one per cent had completed either grades 11 or 12.

Tenure.- Of the 304 farms included in the survey, 228 or 75 per cent owned all the land they were farming; 61 or 20 per cent were owners who rented some additional

Table 9. Tenure of Farm Operators in the Albertville-Garrick Area, 1941.

	Owners	Part-owners	Tenants	Total
No. of operators	228	61	15	304
Acres improved	79	161	100	97
Acres unimproved	100	244	147	131
Total acres occupied	179	405	247	228



land, and 15 or 5 per cent of the operators rented all their land. The part-owners had the largest farms with an average of 161 acres of improved land, followed by the tenants with an average of 100 acres of improved land. Owner-operators had the smallest farms with an average of 79 acres of improved land per farm.

Acquisition of Land.- Almost 70 per cent of the operators acquired their first parcel of land by homesteading or through a Soldier's grant (table 10).

Table 10. Method of Acquisition of First Parcel of Land, Albertville-Garrick Area, 1941

	Number of operators	Percentage
Homestead	207	68.0
Homestead and pre-emption	3	1.0
Soldier's grant	2	0.7
Purchase	66	21.7
Legacy	11	3.6
Rented	15	5.0
Total	304	100.0

The next most important method of acquisition was by purchase, with 21.7 per cent of the operators starting farming by this method.

#### Farmers' Net Worth

The farmers' net worth is the net balance of his financial statement after deducting the total liabilities or debts from the value of the total assets, or things of value owned by the farmer.

Table 11. Distribution of 304 Farm Operators According to Net Worth at the Date of Settlement, Albertville-Garrick Area, 1941.

	Net worth at beginning						
	: Less	: Zero	: \$1-499	: \$500-999	: \$1,000-1,999	: \$2,000-2,999	: \$3,000-plus
Number of farms	5	36	119	55	55	21	13
	\$	\$	\$	\$	\$	\$	\$
Real estate	-	-	-	51	49	310	715
Live stock	255	-	38	178	357	363	591
Equipment	128	18	43	118	400	579	1,188
Feeds, supplies and seed	13	-	1	-	14	12	33
Other assets	44	4	128	375	556	1,242	2,416
Total assets	440	22	210	722	1,376	2,506	4,943
Total liabilities	582	22	9	20	22	86	30
Net worth at beginning	-142	0	201	702	1,354	2,420	4,913

The largest number of settlers (119) started with a net worth ranging from \$1 to \$499, the average amount being \$201. Quite a number of farmers (110) had from \$500 to \$2,000 and only 34 farmers had a net worth of over \$2,000 at the time of starting farming in the area. Five men started with a negative net worth, that is, their debts exceeded their assets. This situation was apparently due to the operators assuming a considerable debt in order to start with some live stock and equipment. The 13 farmers who started with a high net worth (\$3,000 or more) had relatively large amounts of equipment (average value \$1,188) and a substantial amount of "other assets". These "other assets" would include such miscellaneous items as the cash surrender value of life insurance, cash on hand or in the bank, accounts receivable, household furnishings and investments such as stocks and bonds.

Most of these settlers have shown fairly significant increases in net worth since the time of settlement. The relationship between the beginning net worth and the total gain in net worth due to their farming operations is shown in table 12.

Table 12. The Relation Between Beginning Net Worth and Total Gain in Net Worth Since the Date of Settlement for 304 Farm Operators, Albertville-Garrick Area, 1941

	Net worth at beginning						
	: Less	: :	: :	: :	: :	: :	: :
	: than	: Zero	: \$1-499	: \$500-	: \$1,000-	: \$2,000-	: \$3,000:
	: zero	: :	: :	: 999	: 1,999	: 2,999	: plus :
Number of farms	5	36	119	55	55	21	13
Years on farm	6.2	12.7	10.2	10.8	8.0	9.3	7.5
	\$	\$	\$	\$	\$	\$	\$
Average net worth at beginning	-142	0	201	702	1,354	2,420	4,913
Outside income(1)	313	75	258	163	206	348	917
Total	171	75	459	865	1,560	2,768	5,830
Net worth 1941	1,087	2,778	2,458	3,266	3,718	5,006	7,073
Changes in net worth	916	2,703	1,999	2,401	2,158	2,238	1,243
Average gain in net worth per annum	147	213	196	223	269	240	165

(1) "Outside income" includes income derived from non-farm sources such as gifts, legacies, life insurance benefits and so forth, and is a deduction from present net worth in order to arrive at the gain in net worth due to farming operations alone.

The average yearly gain in net worth ranged from \$147 for the settlers who started with a negative net worth, to \$269 for those who started with \$1,000 to \$1,999. Apparently the settlers who started with a high net worth of \$3,000 or more were not able to use the additional capital to good advantage as the yearly gain in net worth tended to fall off after the point of about \$2,000 in beginning net worth was reached.

Present Net Worth of Owner Operators. - The net worth statement and other pertinent information as of April 30, 1941 for the 228 men who owned all the land they were operating is shown in table 13. In every case the values of farm assets are those placed on them by the farmers themselves.



Table 13. Present Net Worth of Farm Owner-Operators by Size of Farm, Albertville-Garrick Area, 1941

		Acres crop land				Average
		Under 50	50-99	100-199	200-over	all farms
Number of farms	No.	58	112	50	8	228
Average acres of crop land	Ac.	33	70	120	237	77
Farm real estate	\$	1,322	2,073	2,852	4,713	2,146
Value of live stock	\$	341	459	658	680	480
Value of equipment	\$	209	469	1,002	2,081	576
Value feeds, supplies and seed	\$	84	146	282	669	178
Other assets	\$	196	347	526	1,599	392
Total assets	\$	2,152	3,494	5,320	9,742	3,772
Total liabilities	\$	673	738	858	2,239	801
Present net worth	\$	1,479	2,756	4,462	7,503	2,971
Average value of real estate per acre of crop land	\$	40.56	29.74	23.81	19.89	27.82
Average value of real estate per occupied acre	\$	8.60	12.18	14.23	12.42	11.92
Debt per acre of cultivated land	\$	20.67	10.58	7.16	9.45	10.38
Total acres	Ac.	154	170	200	379	180
Per cent improved	%	22.6	42.5	61.3	63.1	44.3
Debts as per cent of assets	%	31.3	21.1	16.1	23.0	21.2

The assets, liabilities and net worths all increased regularly with increases in the size of farm. The total value of real estate per acre of cultivated land was very high (\$40.56) for the group of smallest-sized farms (under 50 cultivated acres, average 33) and declined to an average value of \$19.89 per acre for the group of largest-sized farms (over 200 cultivated acres). The value of real estate per occupied acre varied from \$8.60 for the group of smallest-sized farms to \$14.23 for the group of 100-199 cultivated acres in size. For all farms, the average size was 77 cultivated acres, with an average value for real estate of \$2,146 or \$11.92 per occupied acre. This amounts to about \$1,900 per quarter-section.

The total liabilities per cultivated acre tended to decline as the farms increased in size. The range was from \$20.67 in the size group of less than 50 cultivated acres, to \$7.16 for the group of 100-199 cultivated acres.

A consideration of the amount of indebtedness expressed as a percentage of the total assets indicated that it was not excessive. The highest ratio was 31.3 per cent for the smallest-sized group of farms (under 50 cultivated acres); the lowest ratio was 16.1 per cent for the 100-199 acre group, and the average for all farms was 21.2 per cent. Even leaving out "other assets" which include household goods, the ratio was still fairly low at an average of 23.4 per cent. As a rule a ratio of debts to assets of 33.3 per cent is considered reasonably safe for farm businesses.

#### Type of Farming in the Area

As a rule it takes many years for a region to develop the type of farming to which it is naturally adapted. A pioneer farm economy is likely to differ in some respects from the type of economy which will prevail eventually in the region. The

Albertville-Garrick area is well adapted to diversified farming as the climate and soil are suited to both grains and to forage crops for hay and pasture. Some farmers in the area have already progressed beyond the pioneering stage. They have accumulated considerable capital in the form of good buildings, fences, machinery and live stock and practise a fairly diversified type of agriculture. On the other hand, many farmers are still so short of capital that their main emphasis is on cash grain crops. On quite a number of farms in the area further diversification through the expansion of live stock enterprises will depend upon the ability to obtain adequate water supplies. As more of the land has come under cultivation the water-table appears to have fallen.

Utilization of Land.- The importance of wheat as a cash crop increases with increases in the size of the farms (table 14). On the small farms with less than 50 acres of cultivated land, 34 per cent of the acreage was seeded to wheat and this percentage increased to 51 per cent of the area for farms of over 200 cultivated acres. Oats were the next most important crop, increasing in actual acres but decreasing in relative importance as the farms increased in size.

Table 14. Land Utilization by Size of Farm, Albertville-Garrick Area, 1941

	Size of farm - cultivated acres				
	Under 50:	50-99	100-199:	200-over	All farms
Number of records	67	136	76	25	304
Total acres	165	191	256	525	229
Wheat	11	33	64	146	47
Oats	9	12	19	26	14
Barley	1	3	7	14	4
Rye and flax	1	1	2	7	1
Alfalfa seed	3	5	7	20	6
Alfalfa hay	2	2	3	6	3
Other crops	1	2	4	7	2
Summerfallow	1	4	11	26	7
Breaking	4	9	10	32	10
Total crop land	33	71	128	284	94
	Percentage of total				
Wheat	34	46	50	51	50
Oats	27	17	15	9	15
Barley	3	4	5	5	4
Rye and flax	3	1	2	3	1
Alfalfa seed	9	7	5	7	6
Alfalfa hay	6	3	3	2	3
Other crops	3	3	3	3	2
Summerfallow	3	6	9	9	8
Breaking	12	13	8	11	11
	100	100	100	100	100

Alfalfa for hay and seed was the third most important crop, 15 per cent of the acreage on the smallest sized farms and 9 per cent on the largest sized farms being in this crop. About two-thirds of the alfalfa acreage was left for seed. In this northern climate one cutting of alfalfa hay is the usual practice, although in good years two crops are sometimes taken. When the crop is left for seed, only the seed crop is harvested, as the season is too short for both a hay and seed crop. Even with only the one crop taken for seed fall frost damage is sometimes



experienced on the lower lands before the seed is fully mature. Barley was not a very important crop although the area in this crop increased as the farms became larger.

A very small percentage of the land was summerfallowed, ranging from 3 to 9 per cent of the area as the farms increased in size. There is not a serious need for summerfallowing in this region to conserve moisture. Some fields have been cropped continuously for 6 years or more without any serious decline in yields except where weed infestation has become severe. The longer the land is cultivated and as more land is broken up the weed menace becomes an increasingly serious problem. The two worst weeds are the perennial sow thistle and wild oats, with Canada thistles also of some significance. These three weeds appear to flourish under the prevailing climatic and soil conditions. Undoubtedly as time goes on this region will have to devote more land to summerfallow each year and combine larger areas of grass and legumes in the crop rotation if weeds are to be controlled.

Farm Power.— Horse power was the dominant source of power in the Albertville-Garrick area. Of the 304 farms studied, 201 used horses only for power; 27 used both horses and tractor; 27 had horses, a tractor and a threshing machine; 18 were operated by tractors alone; 23 hired all their farm power and 8 borrowed the use of power (table 15).

Table 15. Capital of Farms Using Different Types of Power, Albertville-Garrick Area, 1941

	Type of power					
	Horse	Horse and tractor	Horse, tractor and threshing outfit	Tractor	Hired	Borrowed
No. of farms	201	27	27	18	23	8
Acres crop land	78	134	203	136	51	34
	\$	\$	\$	\$	\$	\$
Real estate	2,300	3,736	5,362	3,520	1,416	1,107
Seed and feed	181	269	387	304	79	54
Live stock	520	527	614	186	74	143
Machinery	437	1,215	2,148	1,843	86	75
Total capital	3,438	5,747	8,511	5,853	1,655	1,379

Farms which hired or borrowed the use of farm power were very small farms with a relatively small amount of capital. Apart from the farms in these two categories the horse-operated farms were the smallest, averaging 78 acres of improved land with a total capital of \$3,438. The horse and tractor units and the farms operated by tractors alone were larger, averaging 134 and 136 cultivated acres with a total capital of \$5,747 and \$5,853, respectively. The farms operated by both horses and tractors and which included a threshing outfit were the largest farms, averaging 203 acres of cultivated land, and having an average total capital of \$8,511.

Comparison of Horse and Tractor-operated Farms.— The average tractor-operated farm was larger than the average size of farm operated by horses alone. For this reason a fair comparison cannot be made between the incomes of farms of these two types of power unless the size of the farms is taken into account. There were 45 farms operated by tractors as the sole source of power or by both horses and tractors. The average size of these farms was 135 cultivated acres. To study the relation of the type of power used on farms, 52 horse-operated farms of approximately

similar size were grouped together and used as a basis of comparisons between horse and tractor-powered farms. These data are shown in table 16.

Table 16. A Comparison of Horse and Tractor-Operated Farms, Albertville-Garrick Area, 1941

	Horse operated	Horse and tractor operated
Number of farms	52	45
Total acres	251	276
Cultivated acres	132	135
Net income	\$ 322	206
Labour income	\$ 433	329
Average yields - 1940		
Wheat	27.6	27.5
Oats	31.9	33.9
Alfalfa (cleaned)	56.1	34.6

The income measures used in this comparison are Labour Income and Net Income. Labour Income is the income of the farm left to the farm operator for his own labour and management after the farm expenses have been paid (exclusive of interest and principal payments on mortgages, etc.), including as a farm expense, interest at 5 per cent on the total capital of the farm. Net Income is the surplus left to the farmer after paying all farm expenses (exclusive of any interest on indebtedness or on owned capital) and all cash family living expenses.

As indicated by both measures, Labour Income and Net Income, the horse-operated farms were a little more successful than the farms that had tractors. As the crop yields for both groups of farms were practically the same, the differences in income were due to the different types of farm power employed. Apparently a quarter-section farm with 136 acres of improved land must have sufficient custom work to offset the disadvantages of a small farm as a power-operated farm, but evidently on the tractor-operated farms in this size group they did not have sufficient custom work to offset the small size of the farms.

Live Stock.- The Albertville-Garrick area is typical of many parts of the forest zone of northern Saskatchewan in that it has very limited areas of wild hay or pasture land. Practically all the land not under cultivation has a light to heavy bush cover. In most cases the feed and pasture for the cattle comes from improved land. This is probably why the number of cows on these farms is very low. The typical number of cows was two per farm; about 60 per cent of the farms had from one to three cows.

In the year the study was made, 50 per cent of the farms had only one sow. About 85 per cent had two sows or less. However, since 1941 there has been a sharp increase in the number of sows kept on these farms. The typical poultry flock was about 30 hens.

Because of the small numbers of live stock, live stock and live stock product receipts did not form a very large proportion of the total farm receipts. The farm receipts are shown in table 17. Wheat sales were the most important source of income (50.7 per cent), followed by live stock and live stock products (21.1 per cent). As the farms increased in size live stock and live stock product receipts increased in total amount but declined in relative importance. Two-thirds of all the farms in the survey were quarter section farms, (in the size group 81-160 acres); the average receipts of these farms from live stock and live stock products were only \$173, comprising 23.8 per cent of the total receipts. Even for these



small farms wheat production was the most important single enterprise.

Table 17. Farm Receipts by Size of Farm, Albertville-Garrick Area, 1941

	Size of farms (acres)								
	: Under: 81- : 161- : 241- : 321- : 481- : 641- : 801- : All :								
	: 81 : 160 : 240 : 320 : 480 : 640 : 800 : 960 : farms :								
Number of farms	6	199	15	56	15	7	3	3	304
	\$	\$	\$	\$	\$	\$	\$	\$	\$
Total wheat receipts	119	359	521	699	1,162	1,271	1,756	1,800	514
Total alfalfa receipts	10	27	30	52	55	60	63	127	35
Other crops	8	25	55	50	262	214	92	182	49
Live stock	94	143	210	249	236	422	145	501	179
Other farm products(1)	66	30	32	35	82	45	78	55	36
Equipment sales	-	11	12	66	38	287	83	32	29
Custom work	43	67	112	138	309	264	577	636	109
Previous year's crop	19	45	17	39	144	91	92	361	51
Other farm receipts	60	19	5	18	10	-	3	37	18
Total farm receipts	419	726	994	1,346	2,298	2,654	2,889	3,731	1,020
(1) Mostly live stock products.									

Commercial and Non-Commercial Farming. - Out of the total number of farms in the survey 19 (6.5 per cent) were classified as non-commercial and 285 as commercial farms (table 18). The non-commercial farms were either subsistence farms (those where the value of farm products consumed on the farm was more than half the gross returns of the farm business) or part-time farms. Part-time farms were those for which non-farm returns were greater than the gross returns from the farm business itself.

Table 18. Types of Farms in the Albertville-Garrick Area, 1941

	Types of farms				
	: Subsistence :	Part-time :	Live stock :	General :	Grain:
Number of farms	14	5	31	103	151
Acres of cultivated land	39	48	54	83	117
	\$	\$	\$	\$	\$
<u>Receipts</u>					
Wheat	61	212	233	421	688
Alfalfa seed	12	6	19	36	40
Other crops	10	17	13	20	80
Live stock	113	47	222	235	144
Live stock products	21	5	106	43	18
Equipment sales	14	8	14	20	41
Custom work	42	37	131	80	132
Previous year's crops	4	-	23	56	60
Miscellaneous receipts	16	9	15	22	17
Total farm receipts	293	341	776	933	1,220
Net income	-181	-425	72	160	273
Labour income	-100	-220	197	296	319
Labour earnings	225	18	487	547	560

There were three categories of commercial farms: (1) Crop farms,- these were farms with 75 per cent or more of the productive labour devoted to crops; (2) Live stock farms,- these were farms with 45 per cent or more of the productive labour devoted to live stock; (3) General or mixed farms,- this category included all of the remaining farms which did not fall into any of the above four farm-type categories.

Approximately half of all the farms were classified as grain farms, about one-third as general farms, one-tenth as live stock farms and the balance were non-commercial farms.

The subsistence and part-time farms (non-commercial) were the smallest farms, with an average of 39 and 48 acres of cultivated land respectively. The live stock farms were also small, averaging only 54 acres. The grain farms were the largest, averaging 117 acres, followed by the general farms with an average of 83 acres of cultivated land per farm.

Three measures of farm income are shown in table 18. Net Income and Labour Income have already been defined on page 12. The other measure, Labour Earnings, is simply Labour Income increased by the estimated value of the house rent and the value of farm produce consumed by the farm family.

The average non-commercial farm failed to meet its farm operating and family living expenses as indicated by the negative incomes. The three commercial types had a surplus above these expenses, the best showing being made by the grain farms with an average Net Income of \$273. However, none of the commercial types as indicated by group averages, were very successful when measured in terms of either Labour Income or Labour Earnings. The tabulation shows that when five per cent interest on the total farm capital was charged as a farm expense the operators received for their labour and management an average of only \$197 on live stock farms, \$296 on general or mixed farms and \$319 on grain farms. Even with the free use of house and farm perquisites \$319 represented a very small yearly wage in 1940-41.

There is no definite evidence in table 18 that the mixed farm was more profitable than the grain farm. The live stock farms, considering their size, were the most profitable type. These farms, with an average of 54 acres of cultivated land, compared with 117 acres for the grain farms, had an average Labour Income of only \$122 less than the grain farms. The difference was even less when the incomes were measured as Labour Earnings. The Labour Earnings per acre of crop land for the various types were as follows: Live stock farm \$9.02, general or mixed farms \$6.59, subsistence farms \$5.77, grain farms \$4.80 and part-time farms \$0.37.

#### Factors Affecting the Settlers' Income

There are many factors which affect a farmer's income. The most important are the size of the farm business, the yields of crops and the productivity of the live stock, the balance of enterprises, the relative efficiency in the use of power and man labour, and the personal qualities of initiative, ambition and energy of the farmer himself.

It is not possible to measure statistically in a satisfactory manner the last of the above factors which probably is one of the most important. The efficiency in the use of power and man labour is largely associated with the first factor, size of farm business. Generally speaking, the larger the farm the greater is the efficiency in the use of power and man labour. The farms in this survey were all so small that it was not possible to show any significant relationship between these efficiency factors and farm income.



The data were not sufficiently detailed to obtain accurate information on the number of pigs raised per litter, the number of eggs produced per hen or the milk production per cow. The productivity of live stock therefore could not be studied in relation to farm income.

The analysis was therefore confined to the three important factors, size of the farm, the yield per acre of wheat, the intensity of live stock production or the balance between live stock and wheat production, and different combinations of these three factors.

Size of Farm. - The relation of size of farm to Net Income and Labour Income is shown in table 19.

Table 19. Relation of Size of Farm to Net Income and Labour Income, Albertville-Garrick Area, 1941.

	Size of farm - cultivated acres				
	Under			200 and	All
	50	50-99	100-199	over	farms
Number of farms	67	136	76	25	304
Average size (acres)	33	71	128	284	94
	\$	\$	\$	\$	\$
Total receipts	523	1,075	1,948	4,137	1,423
Total expenses	329	686	1,291	2,585	914
Farm income	194	389	657	1,552	509
Interest	104	164	258	536	205
Labour income	90	225	399	1,016	304
Cash living expenses	249	372	479	752	403
Net income	- 22	70	286	1,024	181

The cash living expenses of the farm families were very low in the case of the small farms but increased sharply as the size of the farms increased. The two measures of Net Income and Labour Income increased regularly with increases in the size of the farms.

The two smallest groups of farms did not provide a satisfactory income. The group of 50-99 acres of cultivated land (average 71 acres) did, however, provide a subsistence cash living allowance of \$372 and a \$70 surplus. But it was only when the size group 100-199 cultivated acres (average 128 acres) was reached that a fairly satisfactory situation was revealed. In this group the Labour Income was \$399. If interest is not charged on farm capital there was a surplus of \$286 above the cash family living expenditures of \$479.

Yield of Wheat Per Acre. - In farm management studies a close relationship is usually found between yields of crops and the various measures of farm income. In the Albertville-Garrick study this was found to be the case for wheat yields and farm income measures (table 20). There was a progressive increase in the three measures of farm income as the average yields of wheat increased. The exceptions to this rule are explained by the differences in the average size of farm in the different yield categories. For example the single farm in the 50-59 bushel yield category had Labour Earnings of \$1,700, much larger than would be expected, but this is explained by the fact that the farm comprised 157 cultivated acres, two-thirds more than the average of all farms.

Table 20. Relation of Yield of Wheat Per Acre to Three Measures of Farm Income, Albertville-Garrick Area, 1941

							:Animal units:
		:Average:					:less horses:
	: Number of:	yield of:	Labour:	Labour:	Net	: Culti-	: per 100
	: records	: wheat	: income:	: earn-	: income:	: vated	: cultivated
		: (bus.)		: ings		: acres	: acres
			\$	\$	\$		
<u>1940 Wheat Yields</u>							
0 - 9 bushels	3	9.0	100	233	-15	48	7.9
10 - 19 "	54	15.4	102	304	28	92	6.0
20 - 29 "	133	24.8	224	462	111	98	6.0
30 - 39 "	81	32.8	584	792	419	108	5.6
40 - 49 "	16	41.5	444	712	286	71	7.7
50 - 59 "	1	53.0	1,100	1,700	955	157	5.2
60 and over	1	62.0	300	400	84	53	5.2
No wheat seeded	15	-	60	220	-38	30	8.1
All yields	304	26.0	304	525	182	94	6.0

Intensity or Degree of Live Stock Production.- In order to measure the total amount of productive live stock carried on the farms the total number of live stock units, except horses, was calculated for each farm. One live stock unit was the equivalent of the following animals: one cow, one bull, two heifers, steers or calves, five sows or boars, ten hogs, seven sheep, fourteen lambs, or one hundred hens. As a measure of the intensity or degree of live stock production the total productive live stock for each farm was expressed as the number of live stock units per hundred acres of cultivated land.

The relation of the number of productive animal units per hundred acres of cultivated land to the three measures of farm income is shown in table 21.

Table 21. Relation of Productive Animal Units per Hundred Acres of Cultivated Land to Three Measures of Farm Income, Albertville-Garrick Area, 1941

Animal units less horses						: Labour:
per hundred acres crop	: Number of	: Cultivated	: Labour	: Net	: earn-	:
land	: farms	: acres	: income	: income	: ings	:
			\$	\$	\$	
0 - 2	58	123	397	290	455	
2.1 - 4.0	59	117	349	231	602	
4.1 - 6.0	59	103	314	177	532	
6.1 - 8.0	41	85	300	188	581	
8.1 - 10.0	27	74	267	147	531	
10.1 - 12.0	21	57	186	9	456	
12.1 and over	39	48	174	66	463	

One would expect to find a strong positive relationship between intensity of live stock production and farm income. But the opposite appears to be the case, as all measures of farm income decline steadily as the intensity of live stock production increases. However, this situation is due to the stronger influence of the factor of size of the farm. As indicated in the table, as the intensity of live stock production increased, the size of the farms decreased sharply. Apparently this decrease in the size of the farm more than offsets the greater intensity of live stock production so that incomes fall.



In order to reveal the influence of intensity or degree of live stock production it is necessary to compare the different degrees of live stock production on farms of similar size. This is done in table 22 which shows the effect of live stock production in each separate size-of-farm category.

Table 22. Relation of Size of Farm and Productive Live Stock per Hundred Acres of Cultivated Land to Labour Income and Labour Earnings, Albertville-Garrick Area, 1941

Productive animal units per hundred acres	: Number of farms	: Labour income \$	: Labour earnings \$
<u>Under 50 acres of cultivated land</u>			
0 - 4.0	13	100	129
4.1 - 8.0	18	67	149
8.1 - 12.0	15	67	289
12.1 and over	21	119	375
<u>50-99 acres of cultivated land</u>			
0 - 4.0	52	210	364
4.1 - 8.0	43	223	472
8.1 - 12.0	25	320	621
12.1 and over	16	131	457
<u>100-199 acres of cultivated land</u>			
0 - 4.0	34	353	500
4.1 - 8.0	32	438	738
8.1 - 12.0	8	262	507
12.1 and over	2	1,100	1,426
<u>200 and over acres of cultivated land</u>			
0 - 4.0	18	1,078	1,353
4.1 - 8.0	7	857	1,236
8.1 - 12.0	0	-	-
12.1 and over	0	-	-

In general, with a few exceptions, the farm incomes tended to increase with increases in the intensity of live stock production. Another significant fact is brought out by this table; the farms with the greatest intensity of live stock production are the smallest size-of-farm groups. As farms increase in size they do not maintain their intensity of live stock production. This general situation is found in all the farming areas of Saskatchewan.

Combinations of the Three Important Factors, Size, Wheat Yields and Intensity of Live Stock Production. -It is of interest to consider the combined effects of the three important factors when they are all above-average. In table 23, the effect of each of the important factors is considered separately when above-average. Next, the influence of any two factors when above-average is shown, and finally the effect of having all three factors above-average is indicated.

When taking only single factors as above-average, the highest incomes were shown when the size of farm was above the average, followed by farms with above-average yields of wheat. Farms with more productive live stock per 100 acres of crop land (above average in degree or intensity of live stock production) had an average income considerably lower than for the other two groups. This was because these farms were distinctly smaller in size (average only 67 cultivated acres) and had lower average wheat yields.

Table 23. Measuring the Single, Dual and Combined Effects on Farm Income When Three Important Farm Management Factors are Above-Average, Albertville-Garrick Area, 1941

Factors above-average	:Number: : of : farms :	Acres : : culti- : vated :	Yield : : of wheat: : (bus.) :	Animal : : units per : 100 acres :	: Labour : : Labour : : income :	: earn- : : ings :	: Net : : income :
					\$	\$	\$
Size of farm	111	161	27.4	4.4	526	774	428
Yield of wheat	138	105	32.8	5.6	517	744	358
Live stock intensity	128	67	24.0	10.2	236	516	112
Size of farm and yield of wheat	63	162	32.1	4.4	816	1,038	683
Size of farm, live stock intensity	26	121	27.8	8.4	465	746	367
Yield of wheat, live stock intensity	54	75	33.0	9.4	409	709	247
All three factors	16	112	31.9	8.6	669	962	523

With any two factors above-average, the best combination was that for above-average size of farm and above-average yields per acre of wheat. This combination has an average Labour Income of \$816, Labour Earnings of \$1,038 and a Net Income of \$683. The average size of farm was 161 cultivated acres, the average yield of wheat 32.1 bushels per acre and the live stock intensity only 4.4 productive animal units per 100 acres of cultivated land. The poorest combination of any two factors was above-average for yield of wheat and intensity of live stock production. Again this poor showing was due to the small size of farm associated with the high live stock intensity.

The combination of all three factors above-average gave quite satisfactory farm incomes although a little lower than for the combination of the two factors of above-average size of farm and yield of wheat. Again this was due to the influence of the size of farm. For the above two factors the average size was 162 cultivated acres, whereas for the combination of all three factors the average size was only 112 acres.

From this brief analysis it would appear that the importance of the three factors was in the following order: (1) Size of Farm, (2) Yield of wheat per acre, (3) Productive animal units per hundred acres of crop land.

As long as a settler limits his operations to a small acreage of cultivated land, for example, 50 to 100 acres of cultivated land, he will make a greater farm income if he carries a considerable amount of live stock. Up to about this size of business the farm can be operated by the farmer and his family. However, as



more land is cleared, or as the farm is enlarged by buying or renting additional land, the settler does not increase his live stock proportionately with the increase in area of his farm. This is due to a number of factors. Further expansion of live stock would require additional capital for enlargement or construction of new buildings, new wells, new fencing, and more live stock itself. Capital is always a limiting factor in pioneer farming, and few farmers have sufficient funds to expand both the area of the farm and live stock production at the same time.

Moreover, expanding live stock production beyond what the farmer and his family can efficiently handle will often unbalance the whole farm business. An additional 50 acres can often be handled by the same farm labour force with a little planning, or an additional 100 acres could be handled by just using larger power units. But to expand the live stock production 50 to 100 per cent would call for the addition of the first hired man. This additional cash cost might result in only relatively small gains even with a substantial increase in live stock.

#### Farm Family Cash Living Expenditures

The three most important factors that affect farm family living expenditures in Saskatchewan are the size of the farm business, the yield of crops and the size of the family. The results of the analysis of living costs in the Albertville-Garrick area followed the same general pattern as family living cost studies in other areas of Saskatchewan.

The relation of the size of farm to family cash living expenditures is shown in table 24.

Table 24. Relation of Size of Farm to Family Cash Living Expenditures, Albertville-Garrick Area, 1941

	Size of farm - cultivated acres				
	Under 50	50-99	100-199	200 and over	All farms
Number of farms	67	136	76	25	304
Yield of wheat (bus.)	20	26	28	26	-
Adult months per farm	30	38	44	55	39
	\$	\$	\$	\$	\$
Groceries, fruit and meat	138	168	206	274	180
Fuel and light	4	6	6	10	6
Maids hired	1	4	3	9	4
Auto (1)	0	4	8	27	6
Life insurance	1	2	4	5	3
Personal	19	41	59	150	51
Education	2	8	8	24	8
Church and charity	2	5	9	14	6
Health	25	31	38	48	33
Clothing	47	77	105	143	82
New furnishings	10	24	31	38	24
Total cash living	249	372	479	752	403
Cash living per adult month	8.30	9.80	10.90	13.60	10.33

(1) Half automobile expense, if any; the other half is considered as farm expense.

The living expenditures per adult month (equivalent of one adult for one month) increased uniformly from \$8.30 for the group of smallest farms to \$13.60 for the group of largest farms. On the whole these expenditures are lower than

in similar cost of living studies in other areas of Saskatchewan. The main reason for this is the relatively small farms in the Albertville-Garrick area. The farms in the largest sized group (200 acres or more) with an average cash living cost of \$13.60 per adult month compare favourably with costs of \$11.62 and \$15.20 per adult month for the Blucher-Colonsay and Weyburn-Estevan studies which were made in the same year (1941).

The fact that two-thirds of the farms in the survey had less than 100 acres of cultivated land and were able to spend on cash living, only about \$10.00 or less per adult month, is evidence that the district as a whole is still in the pioneer stage of development and has a rather low standard of living.

#### Non-Farm Sources of Income

In most pioneer farming areas there are opportunities for the settler to add to his income from what is commonly called non-farm sources. In the early stages of settlement the pioneer has very little land under cultivation and in spite of the desire he might have to spend all of his time improving his farm, he has to spend some time off the farm in other activities that will bring in ready cash to pay for groceries, clothing and the small amounts of capital he needs to develop the farm.

In the Albertville-Garrick area the pioneers during their early years in the district (about 1920-25 on the western side of the surveyed area, and about 1927-32 on the eastern side) worked in the lumber and logging camps in the winter and spent about 4 to 6 weeks in the fall months harvesting in the Prince Albert, Melfort and Tisdale farming areas. In addition to this they sold a considerable amount of logs off their farms. Sales of cordwood did not become important until after 1932 when the railway came in. Trapping has never been a significant source of income. As no commercial fishing lakes are close to the area, fishing has not been a source of income for the settlers.

Table 25. Non-Farm Sources of Income, Albertville-Garrick Area, 1941

	Size of farm - cultivated acres				
	Under 50	50-99	100-199	200 and over	All farms
	\$	\$	\$	\$	\$
Labour income	90	220	399	1,016	304
Cash living expenses	249	372	479	752	403
Net income	-22	70	286	1,024	181
<u>Non-farm income</u>					
Legacies, gifts	11	10	2	6	8
Pensions	17	15	6	-	11
Non-farm labour off farm	8	13	9	38	13
Cordwood, logs, etc.	29	31	14	13	25
Relief and re-establishment	35	12	5	-	14
Other income	13	33	21	11(1)	24(1)
Total	113	114	57	68(1)	95(1)

(1) Omitting one farmer in the 200 and over group who had considerable income in 1941 from rental of other farm lands.

Table 25 shows the non-farm sources of income for the year 1941 tabulated according to the size of the farm. On the whole the small farms received well over



\$100 per farm. This non-farm income tended to decline as the size of the farm increased. Income from non-farm labour off the farm is no longer an important source of income in this area. Sales of cordwood and logs and relief were fairly important sources of income on the smaller farms but not significant on the large farms.

### Fertility of Soil Types (1)

The soils found in the Albertville-Garrick area are the usual forest soils in northern Saskatchewan, varying from a degraded blackish-grey soil to a light grey or fully podsolized soil. The textures vary from a sand (often called "jack pine sand") to a good clay loam. Somewhat more than a third of the farms were located on "very fine sandy loam to loam soils." In this northern soil-climatic zone these are the typical soils and are moderately fertile. About one-third of the farms were located on "clay loam soils." These are very fertile soils. The balance of the farms were on "peats and sandy to fine sandy loams." The peat soils are productive for certain kinds of crops, such as oats, barley, hay and pasture. They are useless for alfalfa seed production and are only moderately productive of alfalfa hay. Timothy and alsike mixtures, where grown on these soils, have proved to be well adapted.

Some years ago the wooded soils of northern Saskatchewan were considered to be marginal soils because of their low native fertility. At that time some people questioned whether or not the northern forest region could be successfully settled. However, the past ten to fifteen years of settlement have proved that most of the northern soils, where stones and topography are not a hindrance, are well above the margin of cultivation and can be successfully settled. Probably the most significant factor which supports this view was the discovery about ten years ago that alfalfa was very well adapted to practically all the forest soils. Within more recent years it has been proven that alsike clover and the hardier strains of red clover can also be successfully grown. The relatively favourable moisture conditions and the winter snow cover results in very little winter killing. The winter of 1941-42 was the first time that winter killing of legumes was serious.

Although the northern forest soils are well above the margin of successful cultivation, this statement should not be taken to mean that these soils are as fertile as the typical prairie soils. As a rule the forest soils are low in natural fertility, particularly nitrogen. For the first five to ten years of cropping, crop yields are usually satisfactory except on the sandy soils which have a low productivity even in the first years after breaking. After this initial period the yields will fall steadily unless fertilizer and a suitable rotation including legumes are used. But by good farming the soil can be maintained or even improved beyond the original fertility.

The average yields of wheat reported by the settlers for the 10 years 1931 to 1940 are shown in table 26. A most striking fact is the high ten-year average both for the podzolized soils (26.0 bushels per acre) and the degraded soils (28.0 bushels per acre). These ten year averages may be compared with the ten year average of 21.4 bushels for the same period for Rural Municipality No. 429. This municipality about 50 miles south of the center of the area studied, is considered to have the most productive soil in the Park Belt (Melfort silty clay loam).

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(1) The Soils Department of the University of Saskatchewan made a soil survey of the Albertville-Garrick region in the summer of 1941 as part of their program for mapping the soils of the Province. For the purpose of this settlement study all farms were located on the soil map and designated in accordance with the predominant soil type.

Table 26. Average Yield of Wheat Per Acre by Soil Groups, Albertville-Garrick Area, 1941

Year	Podsolized soils			Degraded soils			
	Sand to:	Very fine:	All	Sand to:	Very fine:	Clay	All
	fine	sandy	podsolized:	fine	sandy	loams	degraded
	sandy	loams	soils	sandy	loams	to	soils
	loam	to loams		loams	to loams	clays	
	bu.	bu.	bu.	bu.	bu.	bu.	bu.
1940	26	26	26	24	27	29	27
1939	35	33	34	36	37	41	38
1938	24	25	25	26	27	26	26
1937	23	25	23	23	25	28	25
1936	26	28	27	26	26	29	27
1936-1940	27	27	27	27	28	31	29
1935	24	29	27	35	23	27	28
1934	22	22	22	28	20	25	24
1933	22	27	26	26	31	27	28
1932	26	21	23	22	31	29	27
1931	26	26	26	25	27	31	28
1931-1935	24	25	25	27	26	28	27
1931-1940	25.6	26.0	26.0	27.0	27.0	29.5	28.0

Another interesting fact is the insignificant differences in yields of the different soil textures. This is probably due to the relatively favourable moisture conditions in the forest zone. The heavier soils do not show up to the same advantage as they do in the open prairie where moisture is such a limiting factor. There is the additional fact that most of the yield histories were taken from fairly recently cleared and broken fields. A considerable number of crops on breaking are included in each of the single-year averages. Even the poorer, lighter soils will yield fairly well for a few years. It takes a number of years for the relative productive capacities of the fertile and infertile soils to show up markedly. As one would expect there is some small difference between the podsolized and degraded soils; the difference is two bushels per acre in favour of the degraded soils.

The average yields of oats are shown in table 27. The same situation is revealed for oats as in the case of wheat, relatively high 10-year average yields (47 to 52 bushels per acre), no significant difference in yields between soil textures, and a small difference in yield (5 bushels per acre) in favour of the degraded soils.

The average yields of alfalfa seed are shown in table 28. Alfalfa has been grown for seed for only a few years and reliable data could not be obtained from the settlers beyond 1936. The year 1941 in which the study was made was an average year for seed production but 1942 was practically a complete failure due to some winter-killing, a late, cool, wet season, and early fall frosts. For this reason a seven-year average of the past seven years would be lower than that shown in table 28 and would now run at about 140 pounds per acre for all soil types, a little higher than this figure for the podsolized soils, and lower for the degraded soils.



Table 27. Average Yields of Oats Per Acre by Soil Groups and Years, Albertville-Garrick Area, 1941

Year	Podsolized soils			Degraded soils			
	Sand to	Very fine:	All	Sand to	Very fine:	Clay	All
	fine	sandy	podsolized:	fine	sandy	loams	degraded:
	sandy	loams	soils	sandy	loams	to	soils
	loams	to loams		loams	to loams	clays	
	bu.	bu.	bu.	bu.	bu.	bu.	bu.
1940	48	37	42	46	33	49	43
1939	63	61	62	47	58	71	59
1938	53	50	52	42	43	57	47
1937	50	43	47	45	44	50	46
1936	54	48	51	44	48	52	48
1936-1940	53	48	51	45	45	56	49
1935	44	40	42	45	54	48	49
1934	42	40	40	75	50	46	57
1933	46	44	45	-	54	51	52
1932	32	50	45	-	65	41	53
1931	45	50	48	-	79	54	67
1931-1935	42	45	44	60	60	48	56
1931-1940	47.5	46.5	47.5	52.5	52.5	52.0	52.5

Alfalfa seed production in northern Saskatchewan is going through the experimental period of trial and error which all new crops have to go through. The yields have proved to be highly variable and unreliable. It is quite common for one farmer to have yields as high as 300-500 pounds per acre but his neighbour's seed crop might yield under 100 pounds. Some years, one farmer's crop might average 100 pounds per acre and his neighbour will have no seed at all. The exact reasons for this high variability from farm to farm in the same season are not definitely known. But a few broad facts are known to be of significance. (1) The

Table 28. Average Yields of Cleaned Alfalfa Seed per Acre by Predominant Soil Groups, Albertville-Garrick Area, 1941

Year	All podsolized	All degraded	All soil
	soils	soils	groups
	lb.	lb.	lb.
1940	66	82	74
1939	107	62	85
1938	256	250	253
1937	224	229	226
1936	200	150	175
Average 1936-1940	170	155	163

dark, heavy-textured soils over a period of years are not suitable for alfalfa seed production. The plant growth is excessive and it tends to produce seed pods too late in the season to escape damaging frosts. In dry early season years these soils have produced high yielding seed crops, but it is nearly always a gamble with the early fall frosts. (2) The light-textured soils, particularly the podsolized soils (grey soils) over a period of years apparently are early enough to mature a crop of seed before most early frosts can do any damage. (3) Wet cool

seasons result in low yields on all soil types. Not only is seed setting light but the seed crop ripens slowly and is in danger of being frozen. (4) Seed yields are highest on first and second year seed crops and then decline rapidly and usually reach a low level of about 50 to 100 pounds per acre after the fifth year. (5) So far, experimental work to increase seed yields by fertilizing old fields, has not proved to be generally successful.

It is likely that in the years to come alfalfa seed production will be confined to the lighter-textured podsolized soils and seed fields will not be left five to eight years as they have been.

#### Costs and Progress in Clearing and Breaking Land

The Albertville-Garrick area about 20 years ago was covered by a dense growth of trees and bush, mostly white spruce, white and black poplar, willows and some tamarack. On the sandy soils jack pine predominated. These trees at maturity would range from about 9 inches to two feet in diameter. The few settlers who tried to homestead in this virgin forest faced a difficult task because of the slow progress that could be made in clearing and breaking the land.

As a result of the dry years from 1917 to 1919 great fires swept this region and only after wide blocks were burnt over was settlement able to make reasonable progress. This is not a condonement of the policy of burning the forest before trying to settle the land but just a statement of fact.

As a result of the repeated local fires since 1920 the settlers, on the whole, have not had to contend with any really heavy clearing. Most of the forest cover which has had to be removed was scrub or burnt-over forest land covered with small second growth and rotten logs and stumps.

Costs of Clearing and Breaking.- The average cost of clearing has decreased over the years as a result of fires, the application of mechanical power to pull the larger stumps and a general increase in the labour supply of the district. The costs have fallen from \$6.37 per acre before 1929 to \$3.82 for the 1938-40 period. At no time were the costs excessive. The highest average costs were \$10.48 per acre for heavy bush before 1929. Clearing costs according to the kind of bush and scrub cover are shown in table 29.

Table 29. Average Costs of Clearing Per Acre by Three-Year Periods, Albertville-Garrick Area, 1941

Periods	: Heavy : bush	: Medium : bush	: Light : bush	: Heavy : scrub	: Medium : scrub	: Light : scrub	: All : covers
	\$	\$	\$	\$	\$	\$	\$
1938-40	5.94	4.21	2.98	3.56	3.08	3.14	3.82
1935-38	6.24	4.50	2.97	4.99	3.15	2.00	3.98
1932-34	8.16	5.67	3.56	4.44	2.83	3.00	4.61
1929-31	8.12	5.12	2.78	8.00	(1)	4.38	5.68
Previous to and including 1928	10.48	6.88	3.14	8.00	(1)	3.33	6.37
Average decrease	4.54	2.67	0.16	4.44	(1)	0.19	2.55

(1) Incomplete data.



The average costs of breaking the land have also fallen sharply as indicated in table 30. Before 1929 the cost of breaking was about \$7.00 per acre. In the 1938-40 period costs have fallen to about \$4.50 per acre. The total costs of clearing and breaking show the same down trend since before 1929. This is shown in table 31.

Table 30. Average Costs of Breaking Per Acre by Three-Year Periods, Albertville-Garrick Area, 1941.

Periods	: Heavy : bush \$	: Medium : bush \$	: Light : bush \$	: Heavy : scrub \$	: Medium : scrub \$	: Light : scrub \$	: All : covers \$
1938-40	4.53	4.58	4.41	4.48	4.70	3.78	4.43
1935-37	4.51	4.60	4.60	5.04	4.88	4.21	4.62
1932-34	4.87	5.05	4.38	5.11	5.54	5.40	5.06
1929-31	6.03	5.99	5.24	5.99	6.30	7.46	6.17
Previous to and including 1928	8.04	6.15	6.34	7.47	6.57	7.70	6.96
Average decrease	3.51	1.57	1.93	3.01	1.87	3.92	1.53

Previous to 1929, the average cost to clear and break an acre of heavy bush was \$18.52, whereas in the 1938-40 period the cost was reduced to \$10.47. For the lighter covers the decrease in costs was not so great but for the whole area the costs decreased \$5.04 per acre during the 12 year period.

The change in the cost of clearing and breaking is due, in the main, to the increase of settlement in this northern area, along with a gradual increase in mechanized power. However, all the clearing was done by hand labour, in some cases with the assistance of horses and tractors. Practically no scrub cutters were operating in the area.

In order to prepare the land for crops an additional cost of about \$2.00 per acre would be necessary for root picking and the removal of the few stones which are found on some farms.

Table 31. Average Costs Per Acre of Clearing and Breaking by Three-Year Periods, Albertville-Garrick Area, 1941

Periods	: Heavy : bush \$	: Medium : bush \$	: Light : bush \$	: Heavy : scrub \$	: Medium : scrub \$	: Light : scrub \$	: All : covers \$
1938-40	10.47	8.79	7.39	8.04	7.78	6.92	8.25
1935-37	10.75	9.10	7.57	10.03	8.03	6.21	8.60
1932-34	13.03	10.72	7.94	9.55	8.37	8.40	9.67
1929-31	14.15	11.11	8.02	13.99	(1)	11.84	11.85
Previous to and including 1928	18.52	13.03	9.48	15.49	(1)	10.50	13.33
Average Decrease	8.05	4.37	2.09	7.45	(1)	4.58	5.04

(1) Incomplete data.

As indicated in table 32, about 80 per cent of the clearing has been done with the regular farm labour, the balance with hired labour. A little less than half the breaking has been done by hired labour and power. Before 1929, forty-three per cent of the breaking was done with tractors. Within recent years 71 per cent has been done with this kind of power.

More than 95 per cent of the discing, stoning and root picking has been done by regular farm labour.

Table 32. Percentage of Total Work Done by Farm and by Hired Labour in Land Improvement, Albertville-Garrick Area, 1941.

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Progress in Clearing and Breaking.- The rate of clearing and breaking land since before 1929 is shown in table 33.

Table 33. Average Amount of Clearing and Breaking Per Farm Each Year Since Before 1929, Albertville-Garrick Area, 1941

Year	Acres improved	Year	Acres improved
1940	10.4	1933	3.8
1939	7.4	1932	2.7
1938	10.2	1931	2.9
1937	7.3	1930	2.6
1936	5.6	1929	1.8
1935	5.3	Previous to 1929	5.1
1934	4.6		

The average rate of land improvement has accelerated somewhat during the last few years and at the time of the study was running at an average of about 10 acres per farm per year.

Table 34. Average Progress of Homesteaders in Clearing and Breaking Land, Albertville-Garrick Area, 1941

Year on farm	Number of farms	Average breaking per year	Cumulative breaking per year
	No.	Acres	Acres
First	83	2.4	2.4
Second	103	3.6	6.0
Third	111	4.6	10.8
Fourth	114	4.9	15.7
Fifth	117	4.6	20.3
Sixth	119	6.2	26.5
Seventh	118	6.9	33.4
Eighth	113	6.1	39.5
Ninth	110	6.0	45.5
Tenth	98	6.9	52.4
Eleventh	88	4.8	57.2
Twelfth	62	6.7	63.9
Thirteenth	47	8.0	71.9
Fourteenth	27	5.2	77.1



It is of interest to see the progress in land improvement that the original homesteaders have been able to make in this area. For this purpose the tabulation was confined to homesteaders only. The average progress of the homesteaders in clearing and breaking for each year since they homesteaded is shown in table 34.

Based on the experience of these settlers 5.5 acres can be cleared and broken each year. It would take about 14 years to clear sufficient land to allow a subsistence level of farm living.

#### Factors Affecting Settlers' Progress

There are many factors which affect the progress a settler can make in the forest region of northern Saskatchewan. There are some of these factors which cannot be measured statistically, but which are very important, such as the personal ambition, energy and initiative of the settler. On the other hand, there are other important factors which have affected settlers' progress which can be measured statistically. This section of the report is concerned with the latter.

In order to reduce the number of variable factors and to confine the analysis to comparable data the tabulations deal with only 152 settlers who homesteaded one-quarter sections of land and who have not expanded their holdings beyond the original homestead.

The most satisfactory measures of progress for the settlers were found to be the annual gain in net worth since homesteading, and the amount of land cleared and broken since homesteading.

It was thought that the following factors might be related to the progress of these homesteaders:

- (1) Net worth at the time of homesteading.
- (2) Value of equipment at the time of homesteading.
- (3) Number of horses at the time of homesteading.
- (4) Present acreage of alfalfa.
- (5) Total amount of relief and re-establishment assistance received.
- (6) Age of the operator at the time of homesteading.
- (7) Size of family.
- (8) Type of bush cover.
- (9) Type of soil.

Each of these factors in turn was related to the two measures of settlers' progress as stated above. A number were found to be of minor significance and in fact no single factor appeared to be strikingly important.

On the whole the conditions favourable for progress were as follows:

- (1) Net worth at start above \$500 but less than \$1,000.
- (2) More than 13 years on the farm before significant progress could be shown.
- (3) Less than \$444 in relief and re-establishment assistance.
- (4) Breaking more than 5.6 acres per year.
- (5) Operator less than 34 years of age at date of settlement.
- (6) More than one horse to start with.
- (7) Degraded soil.
- (8) Light bush cover.

Settlers with a net worth at the date of settlement of more than \$1,000 showed smaller annual gains than those with \$500 to \$1,000. Much of this higher initial net worth was in machinery and live stock which could not be readily utilized during the first few years of homesteading.

It appeared that the settlers who had the most direct relief and re-establishment assistance from the Northern Settlers' Branch of the Provincial Government made the least progress. This might be due to the fact that those who received little or no financial assistance were able to get some work off the farm to tide them over, or allow them to make improvements to the farm. There would thus be no debts offsetting the improvements on such settlers' farms as there would be in the case of those who received assistance from the government.

The most important factors were those of soil and bush cover. This is shown in table 35. The most favourable progress was made on the clay loam degraded soils (dark grey to black soils) with light bush cover. The poorest progress was made by those settlers on the podsolized (heavily leached soils) fine sandy loams, with medium bush cover.

Table 35. Relation of Soil and Bush Cover to Settlers' Progress, 152 Homestead Settlers, Albertville-Garrick Area, 1941

Soil type	Present net		Change in net		Change in net worth	
	worth		worth		per year	
	Light : bush	Medium : bush	Light : bush	Medium : bush	Light : bush	Medium : bush
	\$	\$	\$	\$	\$	\$
<u>Podsolized</u>						
Fine sandy loam	1,474	1,925	1,178	1,260	131	115
Loam	3,079	2,582	2,671	1,895	178	199
<u>Degraded</u>						
Loam	2,963	2,377	2,882	2,227	180	159
Clay loam	3,373	2,514	2,895	2,485	223	178

The fact that none of the factors tested showed a strong relationship with progress, with the possible exceptions of soil type and bush cover, indicates quite definitely the importance of the personal factor in settlement. Some of these settlers were able to clear and break about 2 or 3 acres more land per year than their less fortunate or less energetic neighbours. Other things being equal, the energetic homesteader in the forest region of Saskatchewan has made substantial progress, whereas the easy going indolent settler has shown very little progress.

#### Summary and Conclusions

Probably one of the best methods of summarizing and drawing conclusions from a study of this nature is to refer back to the original objectives and pertinent questions which were raised in the introduction to this report. The answers to some of these questions are clear cut; to others they are not quite so clear.

The specific questions which were raised, may now be stated and answered as follows:-

- (1) What degree of financial progress have the settlers been able to make in this area?



Settlers starting with a net worth ranging from nothing to \$3,000 have been able to make an average gain in net worth (equivalent to savings) of about \$200 to \$270 a year for periods of 8 to 12 years on the farm (table 12). Most of these gains in net worth are the result of the present higher valuations of the farms due to the clearing, breaking and building improvements since starting on the farms. To some degree they are also due to gains in farm machinery and live stock inventories.

- (2) What factors appear to have been the most important in the financial progress made by the settlers?

Reasonable financial progress was shown when the settlers started with a minimum net worth of about \$500, and ranging up to about \$1,000. Progress was slow at first and it took about 13 years before significant progress was realized.

The progress a settler can make is largely determined by the amount of clearing and breaking he can do each year. The settlers on the light bush cover, who were able to clear and break more than 5.5 acres a year, made much greater progress than those situated on the heavier bush covers (table 34).

Soil type is also an important factor. The greatest financial progress was made by settlers on the degraded (dark grey to black) soils as compared with those on the podsolized (grey-bush) soils (table 35). Settlement on the heavier textured soils (clay loams) was more favourable to progress than on the loams and on the loams more favourable than on the fine sandy loams (table 35).

Younger settlers (less than 34 years of age) showed more progress than older men.

A number of other factors appeared to have minor significance in settlers' progress. However it is worth while repeating that the most strikingly important factors were the three mentioned above, soil type, soil texture and the kind of bush cover, that is whether it was heavy or light.

- (3) What is the minimum size of farm suitable for settlement purposes?

Most of the settlers in this study started as homesteaders on an uncleared quarter section. The few who purchased land obtained quarter sections with very little broken land. Until these settlers could clear and break sufficient land to become self-supporting from farm revenues alone, they had a very precarious subsistence, living by working off the farm and taking Government relief for food and clothing. Many of them also had considerable aid from the Government for re-establishment assistance in the form of cash loans for the purchase of live stock, feed and seed, machinery and the breaking of new land.

If settlers are to be self-supporting at the time of settlement, they require a quarter-section of land with at least 100 acres under cultivation. Table 19 indicates that the farmers in the 50-99 cultivated acres group had an average net income of only \$70 after spending \$372 on cash living, which is fairly low. The farmers in the next size group 100-199 cultivated acres spent \$479 on cash living and had a net income of \$286. The simple average of these two groups represents a farm of 100 cultivated acres with a probable cash living expenditure of \$425 and a net income of \$178. This study was based on conditions which existed in the business year April 1, 1940 to March 31, 1941, - that was before prices of farm products had risen very much. Crop yields in 1940 were about

normal. It would therefore appear that a farm of 100 acres of cultivated land of average productivity would be a reasonable minimum size for settlement.

- (4) What is the debt carrying capacity of the small farm in the forest region?

The answer to this question depends upon what is meant by a "small farm". If the assumption is made that a small farm means a quarter-section with about 120 to 150 acres of cultivated land then the small farm of the forest region has a small debt-carrying capacity. Farmers in the 100-199 cultivated acres group (average of 128 cultivated acres) had an average net income of \$286 after spending \$479 on cash living (table 19). Practically none of these farmers had automobiles. If \$136 a year were deducted for depreciation and cash operating expenses for the use of a low priced car it would leave an average of \$150 a year to apply on debt reduction. At 5 per cent interest this would pay off a debt of \$1,159 in 10 years. At  $3\frac{1}{2}$  per cent interest it would pay off a debt of \$2,471 in 25 years. However it must be borne in mind that a level of living of \$479 cash for an average sized family is rather low. Moreover, during any 25 year period there is a strong possibility that a series of years would occur when no payments could be made and interest charges would accumulate. This would be particularly true if the unfavourable years were encountered shortly after the indebtedness is assumed. For these reasons the practical limit of indebtedness for the farm of about 128 cultivated acres would be considerably less than \$2,471.

Good half-section farms in the forest region would appear to have a substantial debt carrying capacity. From table 19 it would be noticed that the largest sized group of farms (200 cultivated acres and over - average of 284 cultivated acres) shows an average net income of \$1,024 above cash living expenses of \$752. Some of these farms had automobiles whose expenses are already taken account of so it would be necessary to deduct only about \$100 from the net income figure to allow an automobile on all the farms. This would leave \$924 of surplus income to apply on indebtedness. An annual payment of this amount would pay off a debt of \$7,135 at 5 per cent in 10 years. It would pay off a debt of \$15,222 in 25 years at  $3\frac{1}{2}$  per cent. Again it must be borne in mind that the practical limit of indebtedness under either of the above conditions would be considerably less than the above figures.

- (5) What are the possibilities of the farms in the forest region paying off their present indebtedness?

This question may be answered by reference to tables 13 and 19. The farms in the size group under 50 cultivated acres had an average debt of \$673 with an average net income of \$-22. The farms in the next size group 50-99 cultivated acres had an average debt of \$738 with an average net income of \$70. It would appear that although the debt is small the average farm in these groups would not be able to pay off the present indebtedness as long as the farms continue to be as small as they are. There is a possibility that some of the farmers in these small size of farm groups might be able to pay off their indebtedness if they could break more land and thus increase their capacity to pay. But the majority would have to clear and break an additional 60 acres which at past rates of clearing would take about 12 years. In the meanwhile it would take cash to pay for the breaking and more machinery would need to be purchased as the farms increased in size. By the time these small farms have 120 to 150 acres of land under cultivation and could start paying on indebtedness the total amount of debt would be increased to about \$1,000 to \$1,200 provided no interest was charged in the interval on the present debt. The present debt on these small farms is



mostly made up of old general store accounts, arrears of taxes, direct relief, seed, feed and re-establishment loans advanced by the Northern Settlers Branch of the Provincial Government. Interest at 5 per cent is charged on arrears of taxes. Interest is not usually charged on old store accounts unless a mortgage has been given to protect the creditor. At present no interest is being charged on re-establishment loans.

As the situation appears at present, even with normal returns, a very high percentage of the farmers on the small farms (under 70 acres of cultivated land) are not likely to be able to repay their present indebtedness. If, however, further loans were granted under close and competent supervision, such that the cultivated acreage could be brought up to 120 to 150 acres per farm in about a three year period, there would be a strong possibility that the present indebtedness and the additional loan would be repaid.

- (6) How much farm capital is required for a settler to make a reasonable start at farming in the forest region?

According to values in the summer of 1941 it would require a total capital of about \$3,100 (table 13 - \$3,147) to purchase a farm of 160 acres with 70 acres of cultivated land and the live stock, machinery, seed and feed necessary for its operation. The real estate would be worth \$2,073, the live stock \$459, the equipment \$469 and the feed and seed \$146. Since the summer of 1941 values have risen considerably so that at the present time (December 1943) the capital cost of the above farm would probably be about 20 per cent higher or about \$3,700. A farm of the above size (70 cultivated acres) could not be expected to pay any debt.

To purchase in 1941 a larger farm unit of 120 cultivated acres with 80 acres of unimproved land would cost about \$2,852 for the real estate, \$658 for the live stock, \$1,002 for the equipment and \$282 for feed and seed, a total cost of \$4,462. In terms of a quarter-section unit the total cost would be about \$4,200. At late 1943 valuations it would be about \$5,040 of which about \$3,180 would be real estate. According to the 1940-41 net income statement a farm of approximately this size could pay off \$2,471 if amortized over 25 years at  $3\frac{1}{2}$  per cent. But the practical limit of indebtedness for reasons stated above, would be considerably less than this.

- (7) What non-farm sources of income can the settlers depend upon?

In the pioneer fringe area covered by this survey the present non-farm sources of income were very small. For the year of the study the average amount was only \$62 per farm, apart from gifts, pensions and relief (table 25). On the small farms the amounts were a little larger but still relatively small. This situation is partly explained by the fact that there are no lakes in the region where fishing might be a source of revenue. There are few sawmills left in the area and the lack of suitable forest for cordwood as a result of repeated large scale fires is another factor. In the newer areas of the north, particularly close to lakes, the non-farm sources of revenue for the new settlers would be considerably greater.

- (8) What is the typical cost of clearing and breaking the land?

Practically all the land that is cleared and broken in the Albertville-Garrick area was burnt over before any improvements were undertaken. The bush cover that had to be cleared ranged from a light scrub to heavy bush. However the heavy bush would not be anything like as heavy as the bush of eastern Canada. The biggest trees would



not be more than about one foot in diameter. The clearing costs just before the outbreak of war (1939) would amount to about \$3.00 per acre for the light bush and scrub and average as high as \$6.00 for the heavy bush. These costs are all based on hand labour as no mechanical powered brush cutters were used in the area. For the same period the average cost of breaking would be about \$4.50 per acre for all types of bush cover. Thus the total costs of clearing and breaking would range from about \$7.50 per acre to \$10.50 per acre depending upon the original bush cover. Roots, and stones where present, were usually picked off by family labour. Where done by hired labour about \$2.00 per acre would have to be added to costs of clearing and breaking to arrive at total costs.

- (9) How do the levels of living in the forest region compare with those in the long-settled Prairie regions?

At the time of the survey only a relatively small percentage of the farms visited had automobiles. Despite the obvious reduction in family living costs due to the lack of motor cars two-thirds of the settlers reported living costs distinctly below the average of living costs for surveys made in the same year in long settled prairie areas. This situation was primarily due to the relatively small size of the forest zone farms. On farms of equal size the levels of living of the forest zone farms compare favourably with those of the prairie region.

- (10) What crops are adapted to the forest zone?

In the Albertville-Garrick area of the forest zone the growing season is long enough and there is sufficient freedom from frosts to allow the satisfactory production of the three important cereals, oats, barley and wheat. Of the forage crops alfalfa is probably the best adapted legume. It can be satisfactorily grown for hay on all soil types and for seed production on the lighter grey bush soils. Alsike and red clover have been grown successfully on experimental plots in the area and on a small commercial scale on a few farms. The area is well adapted to alsike and red clover seed production, but only the hardy perennial types of red clover are recommended. Brome grass appears to be the best adapted grass for hay and pasture although some crested wheat grass is also found in the area.

- (11) How fertile are the soils? Can the fertility be maintained?

Based on average crop yields for oats and wheat during the 10-year period preceding the year of study the soils of the Albertville-Garrick area are fairly fertile. The yields for this period have equalled or exceeded those on the highly productive soils in the Melfort-Tisdale area of the Carrot River Valley. So far there does not appear to be the same degree of spread in crop yields between the light and heavy textured soils in the forest region as is found in the prairie region. This is due to the greater moisture efficiency of the forest region.

The greater moisture efficiency of the forest region is conducive to leaching and using up of the native fertility of the soil as compared with the prairie region. Moreover the greater moisture efficiency makes the problem of weed control an important consideration. By the use of well chosen crop rotations, which should include generous amounts of legumes for legume-grass mixtures for hay and pasture, and the addition of manure and chemical fertilizer the fertility of the forest soils can be maintained or even improved.







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